REMARKS

The final office action of November 29, 2005 has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1 through 14 remain in this case. Claims 1 and 8 are independent, and are hereby amended. Support for the amendment are find throughout the application. No new search by the Examiner is deemed necessary.

Rejection(s) under 35 U.S.C. §103

Claims 1-14 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over U.S. Patent No. 5,581,376 to Harrington (hereinafter merely Harrington) in view of U.S. Patent No. 6,157,937 to Wakasugi (hereinafter merely Wakasugi), further in view of U.S. Patent No.5,712,922 to Loewenthal et al (hereinafter merely Loewenthal), and still further in view of U.S. Patent No.5,712,922 to Inoue (hereinafter merely Inoue).

Claim 1 recites, *inter alia:*

> "converting the input image to an output image using an N-dimensional conversion table with a plurality of cubes each having a plurality of nodes, the N-dimensional conversion table being composed of a plurality of at least four subsets of cubes having nodes with each subset containing color information adapted to be simultaneously obtained." (emphasis added)

As understood by Applicants, Harrington relates to an input device that has signals (R_s, G_s, B_s) generated by an image input terminal. The signals are in turn converted to colorimetric values R_c, G_c, B_c. The colorimetric values processed by an image processing unit to generate address entries to a lookup table which stores a set of transform coefficients with which the R_c, G_c, B_c values may be processed to convert them to C_x, M_x, Y_x, K_x colorant signals or any multi-dimensional output color space, which include but are not limited to CMYK or spectral data.

Values which are not directly mapped from the table are determined using tetrahedral interpolation over a hexagonal lattice. The hexagonal lattice is formed by offsetting by a half unit every other row of one of its dimensions relative to another dimension. The offset provides closer packing of sample points that define more regular tetrahedrons to reduce relative interpolation errors. The packing also allows for easy lookup table access and simple tests to determine which tetrahedron contains a desired value. However, in Harrington the number of RAMs does not extend the implementation to more than two rams. The LUT or lookup table is frequently described as N-dimensional therein but never does Harrington state that the table is split into 2^n rams to accelerate the lookup process. For example, Harrington discloses "retrieving for each pixel a set of output color values corresponding to nodes adjacent to the pixel in the conversion table" [see: col. 3, ln. 39 – col 4, ln. 20]. As can be seen, in Harrington, the term "table" is stated in singular form. This necessarily alludes to the presence of a single table requiring multiple accesses to retrieve the values for all neighboring points.

As understood by Applicants, Wakasugi relates to an interpolation circuit for calculating the value of an arbitrary point by interpolation using the values of points on the boundaries of a domain which surrounds the arbitrary point. The circuit comprises a partial product generation circuit composed of multiplexers and a partial product addition circuit for adding partial products generated by the partial product generation circuit together.

As understood by Applicants, Lowenthal relates to neural network based optical character recognition technique that is presented for identifying characters in a moving web. Image acquisition means defines an imaging window through which the moving web passes such that the characters printed thereon can be imaged. Classification data is extracted and accumulated for each printed web character passing through the imaging window. A light source provides transmissive illumination of the web as it is being imaged. A neural network accelerator is

coupled to the image acquisition means for intelligent processing of the accumulated classification data to produce therefrom printed character classification information indicative of each corresponding character imaged. A processor is coupled to the accelerator for converting the classification information into the appropriate ASCII character code. The technique is particularly useful for reading dot-matrix-type characters on a noisy, semi-transparent background at fast real-time rates. A neural network algorithm based recognition method is also described.

As understood by Applicants, Inoue relates to a color conversion method and a color conversion apparatus in which a color conversion is performed. an efficient color conversion table memory is efficiently used and a given color conversion is performed over the entire color space by use of the output values at a plurality of vertices of a unit interpolation solid (non-cube) with continuity being ensured to thereby eliminate the necessity for a color conversion table other than the color conversion table for the input color space. The unit interpolation solid is a non-square solid (see Figs 2(A) to 2(C), wherein the division of a unit solid in the preferred embodiment is shown). A signal line PNTSL is provided in a solid area determiner and a solid interpolation calculator, and the output of a color conversion table memory and the calculation used for an interpolation of a given solid and an interpolation of a divisional solid obtained by dividing the given solid such as a triangular prism interpolation and a tetrahedron interpolation are switched to those for any one of the interpolations.

Furthermore, according to the color conversion method of Inoue, for input color signals of, for example, lightness and chromaticity, or the three primary colors or the tristimulus values, an efficient color conversion table memory is used for a high-speed and high-precision color conversion and by use of the output values at a plurality of vertices of a unit interpolation solid, a given color conversion is interpolated over the entire color space with continuity being ensured

to thereby eliminate the necessity for a color conversion table other than the color conversion table for the input color space. Therefore, compared to the conventional methods, excellent cost performance is realized.

In addition, according to a color conversion method of Inoue, an input color space is divided into unit solids that is NON-cube, lattice point data constituting the unit solids are stored in a three-dimensional color conversion table memory, and an interpolation calculation is performed by use of the color conversion table memory for performing a color conversion of a color image signal expressed by various color signals, wherein lattice point data used for a first interpolation method using a smaller amount of lattice point data for the color conversion is a subset of lattice point data used for a second interpolation method using a larger amount of lattice point data for the color conversion, and the first or the second interpolation method is selected to perform the color conversion.

As can be seen, in Inoue, the division of square solids into the triangular prisms and the tetrahedrons is shown in FIGS. 2(A) to 2(C). The unit solid shown in FIG. 2(A) is divided into two triangular prisms based on the magnitudes of RL and BL as shown in FIG. 2(B). When RL is lower than BL, that is, the sign bit of RL-BL is negative, PRISM=1. When the sign bit of RL-BL is positive, PRISM=0. The triangular prisms of PRISM=0 and PRISM=1 are each divided into three tetrahedrons based on the magnitudes of GL and BL and the magnitudes of GL and RL as shown in FIG. 2(C). The correspondence between the sign bits of GL-BL and GL-RL and the applicable solids is as shown in TABLE 2.

Furthermore, it should be noted that in Inoue, the cube was the starting point or state, the ending point or state is some non-cube solid such as triangular prisms, etc. It naturally follows

that combining Inoue with Harrington, Wakasugi and Loewenthal still results in a non-cube solid as described in Inoue.

Applicants respectfully submits that the combination of Harrington, Wakasugi, Loewenthal and Inoue does not teach or suggest converting the input image to an output image using an N-dimensional conversion table with <u>a plurality of cubes</u> each having a plurality of nodes, the N-dimensional conversion table being composed of a plurality of at least four <u>subsets of cubes</u> having nodes with each subset containing color information adapted to be simultaneously obtained, all as claimed in claim 1.

For similar reasons, claim 8 is deemed patentable as well.

Reconsideration and withdrawal of the rejection are respectfully requested.

DEPENDENT CLAIMS

Dependent claims of the present application, being dependent upon and further limiting independent claims 1 and 8, should also be allowable for that reason, as well as for the additional recitations they contain. Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

Applicants believe the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

Respectfully submitted,

WU & CHEUNG, LLP

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By: ______________________

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